

# Hermes City

**Hermes City** is the largest colony established on Mercury, primarily dedicated to mining and solar energy.

## Structure

Hermes City is situated in the Monk Crater in the upper northern hemisphere of Mercury. It's composed of a city underneath a heat-reflecting dome with a series of solar arrays layered nearby.

The dome is a circle 12 kilometers in diameter, spanning the entirety of Monk. It has a geodesic design with a series of titanium beams supporting the one-way transparent mesh composed of seven layers of alternating aerogel and reinforced glass. On the outer layer, the dome is covered with a heat-reflective coating made of aluminized mylar and ceramics to minimize the heat intake of the city. This causes it to have a very shiny and metallic-like exterior, while it remains fairly transparent on in the interior with a slight gold tint. It is supported by 70 titanium columns on the interior, with some of them functioning as habitable towers.

The city spans the entirety of Monk's basin, excavated to an extremely flat land. There lays a steep hill along the outer rim, which is 8.5 meters tall leading up to the dome. This interior wall and the ground of the city is protected with a layered set of materials to better manage heat intake. On the exterior is a 2-meter-thick wall of Mercurial regolith, followed by a thick layer of aerogel underneath. On the interior, 3-meter-thick concrete composed of Mercurial minerals covers the floor and walls to allow for a structurally stable floor.

Within the concrete lays a network of stainless-steel pipes in a grid-like fashion, informally known as "The Chiller". These pipes continuously pump R-134a, a hydrofluorocarbon refrigerant, across the city and contribute to heat management. Outside of the city itself on the surface is an enormous field of solar arrays that constantly power the city and store thermal energy in tanks for the cold nights.

## **Construction**

Hermes City was first proposed in 2061, when OSA began turning their eyes to colonizing Mercury. Though there had been manned missions and a few mining establishments, none had been as ambitious as an "open-air" city for the common person. OSA created a team under the lead of Robert Granger to plan and construct Hermes City.

Granger was a terracorp CEO who poured billions of dollars into research and construction for the city. He successfully made deals with the mobile mining colonies to supply them with the necessary materials for building the city, and promised Hudson Co. a reserved spot in the city if they excavated Monk. In the end, Hudson Co. was dissolved before construction finished.

The floor of the crater was fully leveled in June of 2073 as materials continued to be transported to the site for use. Titanium was found in small, concentrated deposits across Mercury, meaning that for the large quantity needed for construction the majority of mobile mining groups were tasked with collecting it. Underground factories were built near Monk to refine the titanium and produce the aerogel later used in the heat managing system.

OSA granted Granger special ability to use robotic workers to build most of the city for unknown reasons. The city exterior was completed in July 2078.

Granger auctioned off sections of the city to several hundred entities who subsequently established buildings and factories within the dome. Hermes City became the mining hub of Mercury as the population grew to a peak of 250,000 in 2085.

One of the most famous buildings, the Mercurial Spike, was constructed in 2083 and was quickly named one of the seven wonders of the Solar System.

OSA was given full jurisdiction over Hermes City when Granger died in 2088.

## **Evacuations**

Occasionally the Sun will grow in activity and begin to bombard the planet with extreme levels of radiation and heat. The dome does not have the capacity to block the levels of radiation at the highest points of activity, so evacuation protocols are regularly initiated. About once every 11 Terran years, Hermes City will be evacuated underground to a large bunker where they stay until the Sun calms, an average of 2 weeks.

# Hawking Station

**Hawking Station** is a solar research space station in a close orbit around the Sun, constructed in 2065.

## Construction

Hawking Station was first proposed in 2033 to NASA as a small observatory to monitor fluctuations in solar behavior, initially named the "Hawking Monitoring Probe" after the burning of the Parker Solar Probe in 2029. With various instruments, HMP would scan the composition of Sol, analyze radiation and sunspots, patterns in flares, and establish a point to relay information to farther colonies on the opposite side of Sol. Once OSA formed in 2035 however, the plan evolved into a permanent manned station.

Using funding from the Outreach Grant, resource gathering began in early 2039 with probes transporting lead-rich asteroids to Mercurial orbit. Construction officially started in 2043 after several mining colonies had been established on Mercury, allowing for a consistent supply of silicon and magnesium via mass drivers. The station was to have pieces constructed on the surface of Mercury and then taxied up to orbit where the station would be fully assembled. It also acted as a litmus test, confirming that the station's hull could withstand the intense heat of a Mercurial day.

As construction on the station began, the transported asteroids were stripped of lead and refined to use as a material for a heat shield. This heat shield was a truncated cone with a consistent thickness of 10 cm, composed of nearly pure lead outside a few maintenance hatches. Several low-density spots were purposefully installed in order to allow for the expansion of the lead when exposed to higher temperatures, and connection points were added to properly attach it later to the station via carbon nanotube wires. This shield would greatly diminish the effects of heat and radiation on the inhabitants, allowing them to stay for a max of 8 years compared to the previous max of 2. This heat shield was finished in 2061 and kept in orbit until the completion of the rest of the structure.

## Solar Migration

After construction concluded in late 2065, the 5 rings and the heat shield were attached to the shaft of the station over the course of a few days. Once properly connected and passing a series of tests, the Solar Migration began. Several taxi drones piloted the station into its desired position of about 3 million kilometers away from Sol. Starting in December 2065, the station traveled about 20% of the route before a swarm of probes flew around and attached to the rings. It is completely unknown what their purpose was, as no weapons were attached and they were removed without incident via EVAs. Nevertheless, a defense fleet of drones guarded the station

for the rest of the journey and it successfully arrived into its spot in June of 2066. After another series of checks and modifications by rudimentary drones and construction workers, the station was declared habitable in July that year.

The Solar Migration also includes the series of transports that were sent, taking over 7,000 residents to their new home. They were primarily composed of scientists, engineers, and political figures, rather than A.I. as the electromagnetic interference from the Sun caused them to be unreliable and prone to corruption.

## **Structure**

Hawking Station itself is a space station composed of 5 equal-sized rings, a shaft, the observatory, the heat shield, and a series of arrays and harvesters it controls.

The shaft, nicknamed the Backbone, is a non-moving structure which all rings and the heat shield are connected to. It is exactly 1 kilometer in length and 30 meters in diameter, used mostly as a means of traveling between rings and the structural support for keeping everything together. It's made of a thin wall of silicon and several windows, making it the least protected part of the station. Because it isn't rotating, the environment is completely zero-g, so several handles and ladders are built into the walls to allow for easy maneuvering.

Each of the rings are a kilometer in diameter connected to the shaft by 4 "bridges" that travel along rails as they rotate. The bridges are also fairly unprotected, and are only a few meters in diameter with elevators to travel up and down. Each ring also has a series of tanks attached to their exterior filled with water. This is a method used to capture much of the radiation that makes it through the shield, due to water's high density and hydrogen content. Every ring has a designated purpose.

Ring 1, known as the Portal Wheel, is at what is considered the "back" of the station and holds the spaceport and additional cargo bays. 200 small connectors protrude from its structure that allows spacecrafts with the Q and O locks to attach themselves to the station. Ring 2 is the next ring up, simply a giant cargo room to hold additional equipment and materials. It is kept off-limits to many personnel for unknown reasons. Ring 3, commonly called the Einstein Wheel, is dedicated to scientific research and development. There are instruments to read radiation, sunspots, solar energy, heat intensity, and many other factors needed for research. Ring 4, known as the Huggins Wheel, is dedicated to military protection and communications. Ring 5 is a residential zone, where several apartment-like structures occupy the majority of the ring. About one fourth of the ring is dedicated to a suburban region, where an asphalt road and suburban homes replicate the feeling of a typical neighborhood on Earth. This is reserved mostly for higher ranking officials and political figures, but is sometimes the site of festivals.

An observatory exists at the front end of the shaft, dedicated to recreational activities and lounging in zero-g. It has an artificial grass "floor" and a large transparent dome comprised of borosilicate glass to look into the abyss.

The heat shield is a large truncated cone made of a 10 cm thick wall of lead that blocks heat and radiation from reaching the station. It averages a distance of 940 meters from the shaft, and is connected to said shaft by 14 flexible, carbon nanotube bridges that hold it in place as it orbits.

## **The Attack**

Over time, Hawking Station began to deteriorate as OSA was forced to focus funds towards new colonies and the war effort against the IPC. Technology continuously malfunctioned and research was slowed drastically after several instruments fell offline. Despite complaints from the residents, OSA refused to repair the station and a need for solar research grew, causing the pancorp Helia to arise and begin construction of a new space station, now completely run by A.I. as the regulations had been lifted.

Public focus slowly fell off of the war between OSA and the IPC, causing the war effort to decrease drastically. This let the IPC take control of several colonies, including vital colonies on Miranda and Triton. With the loss of these two industrial powerhouses, OSA was desperate for a victory and needed public opinion to help increase the war effort so they could regain control of these territories. For a solution, because the IPC did not commit any major atrocities, OSA decided to stage an attack on the now obsolete Hawking Station as a means of riling up the people.

At 14:50 UTC on March 2nd, 2128, all high-ranking officials were evacuated and 8 EMPs were detonated around the station to deactivate any means of defense. Through a series of disguised combat ships, the hired pirates Sanaut launched and hit the center of the shaft with a fusion missile. This caused the station to immediately split in two as a chain reaction furthered destruction throughout the structure. Rings 1 and 2 broke apart into pieces of debris as Rings 3, 4, and 5 all collected and collided with each other, causing the heat shield to be disconnected.

In the process of this attack, several pirate groups were hired to raid data in order to properly disguise the operation as the IPC killing innocents for data. OSA successfully "responded" with a series of evacuation ships at 15:40 UTC and managed to rescue a total of 961 residents out of the estimated 4,000 on board during the attack.

The station broke into 4 main parts consisting of Rings 1 and 2, Rings 3, 4, and 5, and the two halves of the heat shield. Each part fell away from each other, causing the pieces of the station to be exposed to extreme heat and disintegrate by 17:00 UTC. The heat shield lasted much longer and slowly fell closer to Sol over the course of three weeks. However, it too burnt away and no remains were collected from Hawking Station. Because several analog camera feeds were live at

the time, and OSA officials publicly blamed the IPC, the people were soon riled up and the war effort escalated once more.

The Helia observatory replaced Hawking Station in 2130.

# Shine

**Shine** is the 3rd largest buoyant city on Earth composed of 18 plates and circulates around the Pacific coast of California and Oregon.

## Structure

Shine was the first developed buoyant city, established in 2049 by the United States and later fell under control of Pacifica in 2052. It's composed of 18 separate hexagonal platforms, "Hexes", independent of one another and connected by collapsible bridges. Several docks are located along the edges and the population rose to 370,000 by 2058.

Each Hex is a ship in a hexagonal shape with the diameter averaging at 1.2 kilometers. To stay afloat, there is a series of floating pontoons underneath their platforms. These pontoons contain a mixture of high-density polyethylene and fiberglass-reinforced plastic to maintain structural integrity while still providing a substantial amount of buoyancy to the city. These pontoons are connected to the city via a sheet of carbon fiber-reinforced polymers that allows for a lightweight and strong platform.

8 meters above these platforms is a slab of concrete that covers the entire hexagon, on which the main city is built. In this space between sits a network of large pipes and paths, commonly referred to as "The Subhalls". These Subhalls consist of various sewage pipes, secret military roads, and several maintenance hallways; all of which are out of commission. Each Hex had these networks that allow for quick and secret navigation across the city.

On top of each Hex is the actual city, which mimics a shorter version of Los Angeles. Due to weight restrictions, buildings are much smaller and composed of lighter materials such as carbon fibers and polymers.

13 of the Hexes are dedicated to urban centers, filled with typical buildings and a clean grid of roads (for the most part). The remaining 5 are dedicated to a harbor, airport, and 3 large greenhouses that encompass entire platforms.

In the event that Shine is caught in a tropical storm, poor weather, or a military attack, the Scatter Protocol was developed. This is where the bridges all disconnect quickly and each Hex splits into a different direction, though sometimes in packs. This is to make it a harder target to take down, and if one Hex falls the rest will remain stable. Emergency control is granted to the local governors and the turbines are pointed to navigate away from danger.

## Social

The social dynamic of Shine is unique to Earth, where an equal control of private and federal government control the city.

The official government is led by a governor, who answers to the Pacifican government. They have very similar powers compared to American mayors, and largely follow the same rules. On the other hand, there are factions controlled by corporations and private individuals that informally protect the city.

These factions provide defense in terms of police and military, all organized under different names but linked together by a network run by the regular government. There are hundreds of factions, and over 50% of the city's population are members of a faction.

Despite strict restrictions on weapons and drugs, Shine falls under faction wars and disputes regularly. The outer ring of urban Hexes, known as Rims, are designated for impoverished and violent populations, causing crime to skyrocket in those areas. Meanwhile, the more central regions are designated for higher income and safer regulations and policing.

The Lumen faction of Hex 12, notable for their role in the Siege of Shine, is composed of 3 smaller factions that handle varying tasks. Magenta acts as a defense team to protect trade and smuggling in the southeast sectors, Saffron manages transportation of goods, and Lime specializes in the smuggling of weapons and drugs.

### **Siege of Shine**

In 2055, the war between the IFC and Pacifica had been raging on for some time. As Pacifica annexed the southern region of California, the IFC government took action to take control of Shine and use it in a trade for the region back.

Several stealth submarines began the attack by launching EMP missiles in between Hexes, disabling parts of the security system. As a result, Shine went on a hard lockdown and followed the Scatter Protocol once the submarines were scanned. As the Hexes split apart, a group of 25 military boats surrounded Hex 12, the platform home to the city's capital and governor.

Using carbon harpoons and air support, they halted the movement of Hex 12 and invaded. To counteract the strong faction militaries present, they deployed a chemical weapon of Argon Mist. This is an extremely toxic gas composed mostly of argon, and has an opaque, purple look. In a matter of minutes, over 65% of the Hex's population were killed from this poisonous gas.

After deploying enough gas, IFC soldiers invaded and raided buildings, until eventually reaching the capital. Without any escape, they held the governor hostage and began to make demands for the return of the southern Californian region in exchange for the return of Hex 12. Pacifica kept silent for 36 hours.



The Lumen faction played a significant role in fighting this siege, where scouts traveled to a previously secret Phantom Missile location, where they gathered fissile material to launch at the destroyers surrounding the city. Over 800 missiles were fired from their fissile barrage, and 13 of the 25 destroyers were severely damaged.

As people escaped, the Magenta group of Lumen placed charges all over the capital building and detonated it, marking the end of the siege in 80 hours. The IFC surrendered less than a month later.

# Bubble Complex

The **Bubble Complex** is a complex of domed structures in the Sea of Tranquility of Luna, and the first permanent colony established on the moon.

## Structure

The Bubble Complex is comprised of 4 different sections: the Armstrong, Aldrin, Selene, and Lovell bubbles. Though each bubble was constructed at a different time, only the Armstrong bubble has a differing structure from the rest. However, all of them are dome-shaped.

The Armstrong bubble is 100 meters in diameter and the smallest of the four bubbles. A mound composed of Lunar concrete surrounds the lower layer of the dome, with a 3-meter-tall titanium-magnesium alloy wall marking the interior. The wall curves at a relatively sharp angle and meets at the top to create the dome shape. Though most of the roof is opaque, 55 silicon-reinforced windows are dotted around. On the northern side, the original colony “Peony” stands as a collection of small dome habitats and trailers, all covered with a black radiation umbrella. There are multiple tubes that lead between the two structures, and Peony is off limits to regular civilians.

The Aldrin, Selene, and Lovell bubbles are all much larger at an average of 1.9 kilometers in diameter. They are similar sizes and were constructed in the same manner, primarily by teleoperation. They too have titanium walls, but are reinforced with a mixture of Lunar concrete and magnesium metal plates, shielding the interior titanium wall at 7 meters tall. The roof itself is the main difference, which is a tall dome of transparent glass composed of various radiation-reflecting materials (mostly silicon dioxide). The highest points of the domes are about 50 meters directly up from ground level.

All of the domes are connected via tubes and airlocks, with each dome having a separate ventilation system. They’re organized in a cross shape with the Armstrong bubble being placed on the north. The ventilation system harvests oxygen from Lunar regolith and combines it with a storage of nitrogen and other chemicals to mimic Terran air. Several thousand vents are spread across the colony for collecting CO<sub>2</sub> and replenishing the air at a regular rate. To create a warmer climate, the air is heated up before being released into the interior through an array of radiators powered by external solar panels.

Surrounding the Bubble Complex is a grid of industrial buildings and solar panels. Most of the buildings are dedicated to harvesting Lunar regolith and tele-operating golems to mine out various regions of Luna. A spaceport sits on the southern side, directly connected to the Aldrin Bubble. The remaining structures are either connected through underground routes (that are poorly regulated) or only through ventilation, meaning EVAs are necessary for some commutes.

## **Construction**

The construction of the Bubble Complex took a total of 18 years, with Armstrong in 2037, Aldrin in 2041, Selene in 2046, and Lovell in 2055. The latter three domes were made via tele-operation, while Armstrong was constructed mostly by manual operation by the first colonists.

The Armstrong Bubble was mostly for scientific research, but when Aldrin was constructed an influx of tourists and industrial workers moved to populate the colony. As civilian transportation became easier, the Bubble Complex rose to a steady population of about 150,000 residents and 2.5 million annual tourists.

## **Abandonment**

As systems began to break down, OSA concluded that the Bubble Complex was not worth repairing and evacuated the population in late 2077.

# Arden City

**Arden City** is the first and only major settlement established on Uranus' moon, Miranda. It's a hub for slave labor and is outside the dominion of major governments such as OSA.

## Structure

Arden City is built into the Arden Corona, a region in the south eastern portion of Miranda. It's a city that hangs into the northern wall, supported by a series of steel and dense silicate beams, though its low gravity doesn't require much structural support. The city sticks out in several layers, each extruding out farther the higher up the wall it's placed. It's completely indoors with very few windows and glass to see the exterior, and encompassed with thick, radiation protecting materials. It measures 2 kilometers in length and 1 kilometer in height, with the width ranging due to the disorganized nature of the platforms.

The "Primitive Block" is the original region of the city where the colony was first constructed, intended for a population of only a few thousand. Outside of this block the city is constructed through various contractors and differing resources, usually haphazardly built due to the short deadlines they were given. Each section is closed off by a series of bulkheads, so when one part falls off into the corona the rest remain stable.

Deeper into the wall sits the city of Silica, a massive subcity that houses the majority of the impoverished population. It has flimsy structural support and poor ventilation, causing inhabitants to have to wear masks to filter out silicate debris in the air.

After the construction of Silica in 2175, political turmoil began to ravish Arden City as different gangs began to fight for power in the subcity. The Arden Police Force (APF) largely stayed out of Silica affairs, and only intervened when the exterior city was in danger. Since Arden City was mostly controlled by Tsena, the APF regularly took slaves from Silica to use in mining ventures in exchange for the promise of staying out of gang-related issues.

## History

### Construction

Arden City was originally founded when the first manned mission, Bure VIII, landed on Miranda's surface in 2138. However, the moon was left untouched for decades until the corporation Tsena decided to take over the operation and begin construction of Arden City.

They launched the first construction probes in late 2149, and the first inhabitants were shipped in 2156. The initial population consisted of both slaves and executives, with about 8,000 people moving within the first few years after 2156. As Tsena grew rapidly due to their mining ventures

from Uranus' atmosphere and rings, the population began to expand to a high of 530,000, with over 35% of them being documented slaves.

Overcrowding became an issue, and Tsena ordered the mass demolition of a large space inside the corona's walls, where it was quickly reinforced and labeled a safe area. They then forced over 50,000 inhabitants to move inside this new region, which was later dubbed Silica for its constant silicate dusts and particles that rain from the cavern's roof.

This homeostasis of sorts was kept as the status quo for 23 years until the rise of the Guran Guild in 2198. The Guran's developed an extreme police force that overtook the majority of Silica within months due to their new access to illegal weapon imports. Most of Silica fell under the control of Guran, who then riled the people up to fight against the APF's system of taking slaves.

In the Miranda Civil War, military forces of Silica and the APF clashed in a year-long battle that resulted in the death of 18,000 civilians. To end the battle, Tsena ordered the collapse of the cavern entrance to seal off any attacks from entering the exterior city. This led to Silica becoming trapped and cut off from the outside.

Guran began mining efforts to escape the subcity, but with dwindling supplies and destroyed filters, the Silican population eventually fell under anarchy once more as fights for resources broke out. Without an accurate death count, the majority of Silicans died within the next decade and the cavern was opened up again in 2212 when Tsena faced more overpopulation issues.

This civil war led to a major shift to zombie slaves (Zeds), which were humans genetically engineered to have less consciousness to comply with OSA regulations regarding slavery. This allowed them to officially reenter trade with OSA (though they were already doing it under the table at a much smaller scale). Genetic labs opened up and by 2230 over 80% of Arden City's population were Zeds undergoing rapid maturity for their eventual deployment into the rings or atmosphere of Uranus.